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STATEMENT OF OBJECTIVES  
OPEN FILE REPORT

**Status Of The Ray Mountain Caribou Herd**

by Scott R. Robinson

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## STATUS OF THE RAY MOUNTAINS CARIBOU HERD

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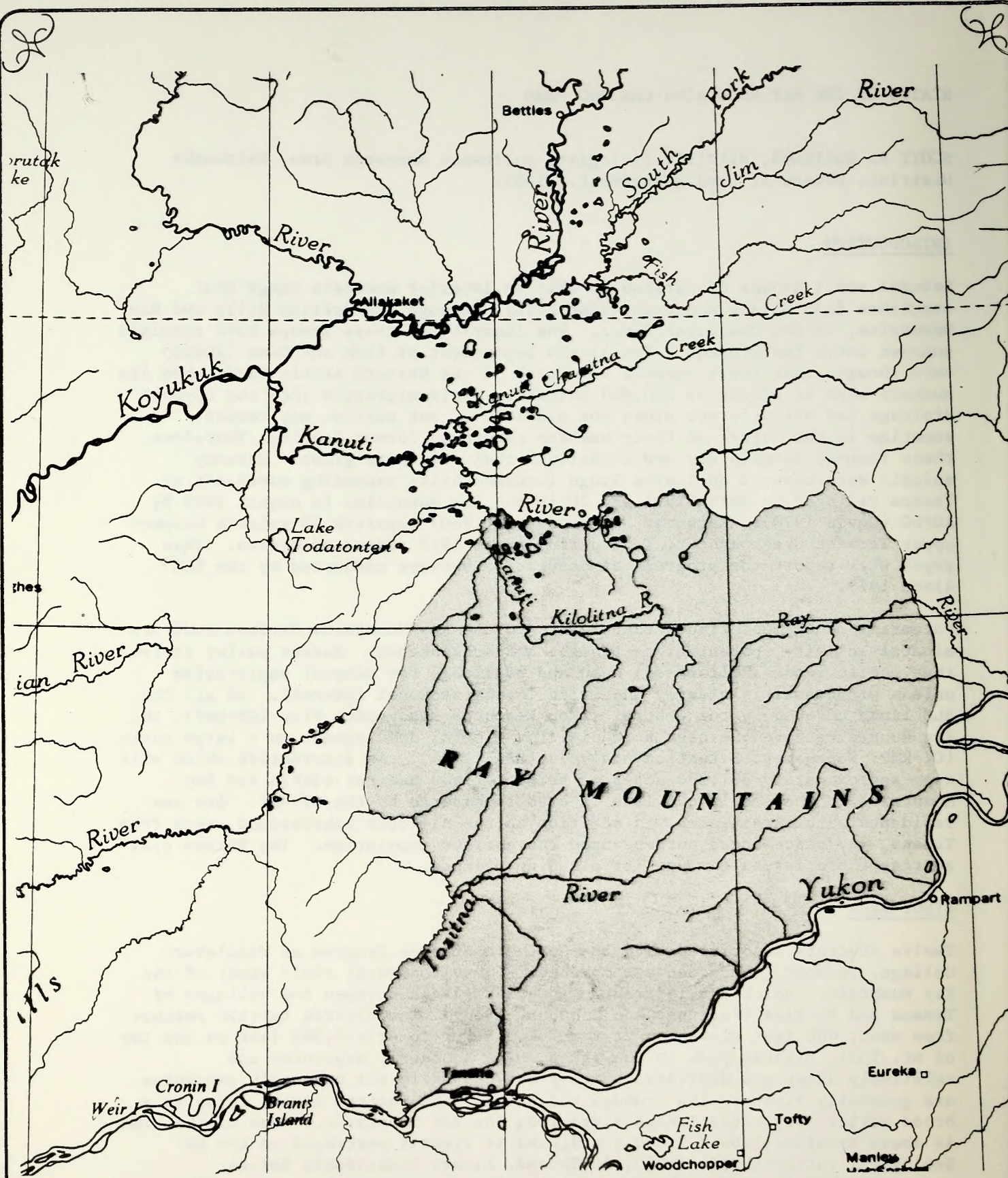
### INTRODUCTION

Several small groups of caribou inhabit an interior mountain range that stretches from Galena Mountain (VABM Bald), through the Kokrine Hills and Ray Mountains, to the Chandalar River. The identity of these groups have remained unknown until the present. The Alaska Department of Fish and Game (ADF&G) once thought that these animals were part of the Western Arctic Herd, when its numbers were in excess of 250,000 animals. Their migration into the Koyukuk drainage has not occurred since the mid-1970's, but caribou may return sometime in the future as their numbers return to former levels. Therefore, these remnant animals may now constitute their own herd group. Seventy animals were counted on Tanana Ridge (unnamed hills extending northeast of Tanana village) in March 1977 and 20 in the Ray Mountains in August 1978 by ADF&G (Davis 1978). Farquhar and Schubert (1980) reported 78 animals between upper Torment Creek and Mt. Tozi during their 1979 summer excursion. This paper will report the progress of population surveys conducted by the BLM since 1979.

Potential management issues that relate to the Ray Mountains Caribou Herd are mineral activity, potential settlement and subsistence. Bureau policy states that public lands shall remain open and available for mineral exploration unless withdrawal is clearly justified in the national interest. Of all the BLM lands covered by the Central Yukon Resource Management Plan (CY-RMP), the Ray Mountains have the best potential for mineral development on a large scale (CY-RMP: Management Situation Analysis (MSA) 1984). An alternative which will open approximately 331,300 acres of prime caribou habitat within the Ray Mountains to the settlement laws is also considered by the CY-RMP. Any new residents within this area, in addition to the historic subsistence users from Tanana, may place added burdens upon the caribou population. The Bureau will address these issues through its planning process.

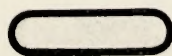
### STUDY AREA

Twelve students associated with the Northern Studies Program at Middlebury College, Vermont, conducted a comprehensive environmental field study of the Ray Mountains, which are located in interior Alaska between the villages of Tanana and Bettles (Farquhar and Schubert 1980). The diverse terrain reaches from about 400 feet elevation at the Yukon River to over 5,500 feet on the top of Mt. Tozi, highest peak in the range. The southerly exposures are relatively steep and dissected by deep canyons while the northerly exposures are generally flatter with rounded ridgetops. The Tozitna River, lying in a broad valley, separates Tanana Ridge from the Ray Mountains. Much of the area is above treeline (about 2,000 feet), and is clearly portrayed on the US Geological Survey (USGS) 1:250,000 Tanana, Alaska Topographic Series quadrangle (1976). The uplands support primarily grizzly bear and caribou, while the lowlands support primarily furbearers and moose.

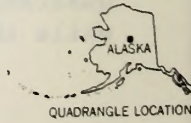
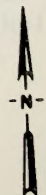
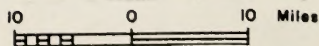


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FIGURE 1 | LOCATION MAP



Study area



QUADRANGLE LOCATION

Much of the area has been identified as prime habitat for caribou by ADF&G. Prime habitat is defined as "capable of supporting maximum densities of one or more species groups on a long-term basis and are necessary to the perpetuation of those populations" (Anonymous n.d.). In cooperation with the ADF&G-Habitat Division, the BLM identified prime habitat for the Ray Mountains Caribou Herd during its land-use planning process for the Central Yukon Planning Area. The Yukon River, Tozitna River, Dagislahkna Creek and Kanuti River form the eastern, southern, western and northern boundaries of the prime caribou habitat, which encompasses approximately 1.29 million acres (Figure 1).

The metallic mineral deposits occurring within the Ray Mountains are listed as mostly speculative and hypothetical. This classification is applied to undiscovered mineral deposits that may reasonably be expected to exist in a known mining district under known geologic conditions. Exploration that confirms their existence and reveals sufficient quantity and quality will permit their reclassification to identified resources. Table 1 presents the known mineral resources within the Ray Mountains. Three occurrences of asbestos encompassing six active mining claims, three occurrences of the strategic mineral chromite encompassing 19 active mining claims, seven occurrences of gold encompassing 34 active mining claims, two occurrences of tungsten encompassing 680 active mining claims and two occurrences of an unknown commodity encompassing two active mining claims are located on BLM land. Coal and geothermal are potential energy sources (CY-RMP: MSA 1984).

#### OBJECTIVES

Objectives of this inventory project were (1) to determine population status and trend, and (2) to delineate seasonal use areas and herd boundaries.

#### METHODS

The BLM conducted 13 survey flights in fixed-wing aircraft from 2 March 1983 to 22 May 1984 for a total of 76.5 flight hours (Table 2). Two of these flights (3/24/83 and 3/13/84) were cut short due to strong winds. A second airplane piloted by ADF&G biologists assisted on two other occasions (10/15/83 and 11/1/83). The BLM usually chartered Piper Super Cubs while the ADF&G used a Bellanca Scout. Future surveys are planned for two consecutive days during each October-November (early winter), March-April (late winter) and May (calving) from FY 1985 to FY 1988; this totals six survey days per year.

#### RESULTS

Caribou were observed on ten of the 13 flights and no caribou were observed on three flights (24 March 1983, 2 June 1983 and 13 March 1984). Only the total number of animals were recorded on the first three surveys, while adult/calf counts began with the 19 May 1983 flight. Fifteen bulls counted on 6 April plus 149 cows/calves counted on 22 April were the greatest total observed during the 1983 late winter survey (Table 3). The 1983 calving survey recorded a mere sample size of 37 caribou, while the early winter survey conducted on 1 November recorded the maximum number of observed caribou: 400. The 15 October survey recorded significantly fewer animals than on 1 November, and are not reported here. The 1984 late winter survey recorded 387 caribou, while 168 were observed one month later during the peak calving period.

The newborn calves observed in May 1983 were 22 percent of the total observed caribou and this ratio dropped to 17 percent by 1 November (Table 3). The 67 calves estimated on 1 November were extrapolated from a sample of 15 calves/75 adults. By April 1984, the observed calves were 13 percent of all observed caribou, but newborn calves in May returned to 23 percent of the total observed caribou.

The observed distribution of caribou for each of the three survey seasons is recorded by township and range in Table 4 and displayed in Figure 2. Newborn calves were observed in 15 of the 18 townships where adult caribou were sighted. Caribou distribution was more restricted (9/18) during the early winter and the most restricted (6/18) during the late winter surveys. The three townships located on Tanana Ridge (T. 7 N., R. 19, 20 W. and T. 8 N., R. 18 W.) and the six townships surrounding Kilo Hot Springs (T. 11 N., R. 17 to 19 W. and T. 12 N., R. 17 to 19 W.) represents two important habitat areas on BLM land that is consistently use by caribou throughout the year.

The known mineral resources within the Ray Mountains are also recorded by township and range in Table 4 and displayed in Figure 3. Most of the active mining claims (740/741) lie outside the two important habitat areas described above, of which 680 claims are for tungsten in T. 11 N. R. 20, 21 W. The two important habitat areas contain two occurrences of gold on an active mining claim and one hot springs of submarginal value for geothermal energy.

Movements of caribou can only be speculated based upon observations of their trails. The ridgetop extending through the important habitat area on Tanana Ridge appears to be such a migratory pathway; also, four north-south trails have been seen crossing the east-west ridge of the Ray Mountains (Figure 1). The eastern most trail crosses along the north and east sides of Spooky Valley, while the other trails cross saddles located at T. 10 N., R. 19 W., Sec. 3; T. 11 N., R. 20 W., Sec. 26 and T. 12 N., R 21 W., Sec. 31. Long time residents of Rampart have seen caribou crossing the frozen Yukon River on their way to the Sawtooth Mountains during the 1940's and 1950's.

Current levels of use on the caribou cannot be evaluated. Residents of Tanana have hunted the Ray Mountains Herd in the past and probably continue to do so at the present time. Snowmobile tracks inside the important habitat area located on Tanana Ridge have been seen during survey flights. Predation is suspected to be a major factor influencing population expansion because of the apparently stable population and the low human harvest levels. One grizzly bear seen within the important habitat area surrounding Kilo Hot Springs and a den site located on Tanana Ridge were the only observed signs of predators.

#### RECOMMENDATIONS

Based upon our present knowledge, a small caribou herd exists within the Ray Mountains that is independent of the Western Arctic Herd. Historic harvest regulations for both herds have been the same: five caribou per day from 1 July to 30 April. Based upon this new data, the State Board of Game accepted an ADF&G recommendation to change this regulation to one bull from August 10 to September 30 for the Ray Mountains Herd. To further expand our knowledge, the following recommendations are made for BLM management:



1. The three season surveys should be continued to determine the population trend over time. This information can then be used for revisions of land-use plans. Procurement costs for FY 1985 should approximate \$5,800.
2. The Bureau should develop a Habitat Management Plan (HMP) for the Ray Mountains Caribou Herd to address the potential management issues addressed in the Introduction.
3. The Bureau defines crucial habitat as that which is necessary to sustain the existence and/or the perpetuation of a species at critical periods during its life cycle or those factors needed to maintain a healthy wildlife population in their normal life cycle (USDI BLM 1973). The identified important habitat areas should be labeled as crucial habitat and be withdrawn from mineral entry through the Bureau Planning System (Figure 4).

#### LITERATURE CITED

Anonymous. n. d.

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Davis, J. L. 1978.

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Farquhar, N., and J. Schubert (ed.). 1980:

Ray Mountains, Central Alaska: environmental analysis and resources statement. Middlebury College Press, Middlebury, Vermont. 390 pp.

USDI, BLM. 1973.

Wildlife inventory, Manual 6610. Rel. 6-41. Bureau Land Manage., Washington, D. C.

TABLE 1. MINERAL COMMODITY AND ACTIVITY  
RAY MOUNTAINS

COMMODITY	TWP	RNG	CLAIMS	ACTIVITY	RESOURCE <sup>1</sup>
Asbestos	11N	14W	2	Active Exploration	Speculative
		15W	1	Active Exploration	Hypothetical
	12N	15W	3	Active Exploration	Speculative
Chromite	16N	14W	5	Active Exploration	Hypothetical
		16W	10	Active Exploration	Hypothetical
	17N	16W	4	Active Exploration	Hypothetical
Coal	08N	19W		Occurrence	Submarginal
Geothermal	11N	18W		Occurrence	Submarginal
	13N	16W		Occurrence	Submarginal
Gold	06N	17W	8	Active Exploration	Hypothetical
		23W	0	Historic Site	Hypothetical
	07N	17W	20	Active Exploration	Hypothetical
		18W	5	Active Exploration	Submarginal
		20W	0	Favorable Geology	Speculative
	10N	18W	0	Inactive	Hypothetical
	12N	19W	1	Active Exploration	Hypothetical
	Limestone	06N	21W	0	Occurrence
Tin	09N	15W	0	Occurrence	Hypothetical
Tungsten	11N	20W	315	Active Exploration	Hypothetical
		21W	365	Active Exploration	Hypothetical
Unknown	12N	17W	0	Favorable Geology	Speculative
		20W	2	Active Exploration	Hypothetical

1. Definitions from BLM Manual 1605.42A1

Submarginal - Identified Subeconomic Resources which would require a substantially higher price of the commodity on the market (more than 1.5 times the price at the time of determination), or a major cost reducing advance in technology.

Hypothetical - undiscovered materials that may reasonably be expected to exist in a known mining district under known geologic conditions. Exploration that confirms their existence and reveals sufficient quantity and quality will permit their reclassification as Reserve or Identified Subeconomic Resource.

Speculative - undiscovered materials that may occur either in known types of deposits in a favorable geologic setting where no discoveries have been made, or in as yet unknown types of deposits that remain to be identified. Exploration that confirms their existence and reveals sufficient quantity and quality will permit their reclassification as Reserves or Identified Subeconomic Resources.

TABLE 2. DATES OF CARIBOU SURVEY FLIGHTS  
RAY MOUNTAINS

DATE	AIRCRAFT	TOTAL HOURS	TOTAL CARIBOU
2 Mar 1983	Super Cub	7.08	131
24 Mar 1983	Super Cub	2.97	0
6 Apr 1983	Super Cub	5.77	71
22 Apr 1983	Super Cub	5.92	149
19 May 1983	Super Cub	7.25	10
26 May 1983	Super Cub	3.38	27
2 Jun 1983	Heliocourier	5.92	0
15 Oct 1983	Super Cub	8.00	149
	Scout (ADF&G)	-	
1 Nov 1983	Super Cub	6.45	400
	Scout (ADF&G)	-	
13 Mar 1984	Super Cub	4.38	0
24 Apr 1984	Super Cub	7.50	387
21 May 1984	Super Cub	6.65	95
22 May 1984	Super Cub	5.23	73
	Total Hours	76.50	

TABLE 3. AGE COMPOSITION  
RAY MOUNTAINS CARIBOU HERD  
APRIL 1983 - MAY 1984

SEASON	ADULTS	CALVES	TOTAL	% CALVES
Late Winter 1983 <sup>1</sup> (April 6 & 22)	-	-	164 <sup>2</sup>	-
Calving 1983 (May 19 & 26)	29	8	37	22
Early Winter 1983 <sup>1</sup> (November 1)	333	67	400	17
Late Winter 1984 (April 24)	338	49	387	13
Calving 1984 (May 21 & 22)	130	38	168	23

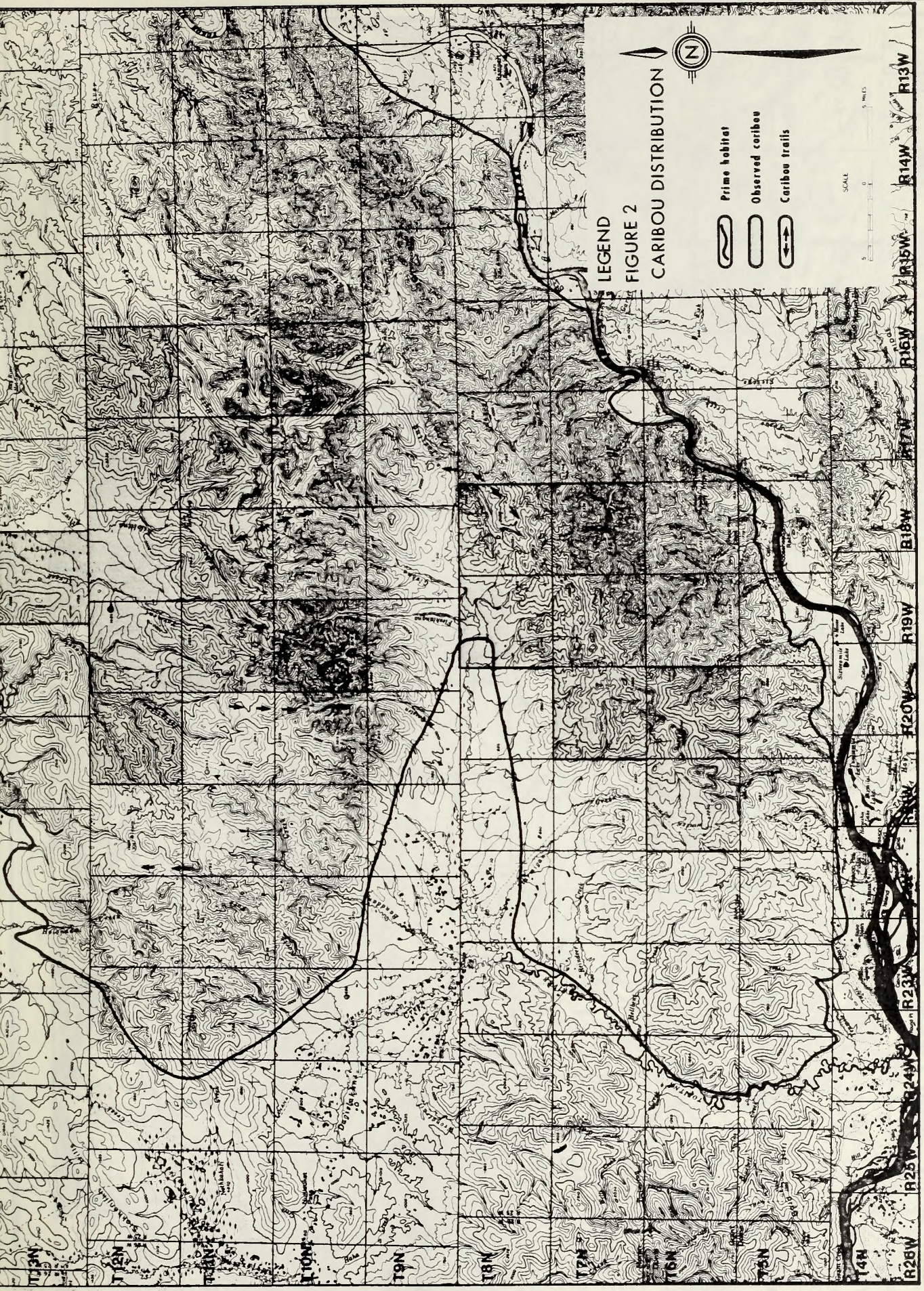
1: Observations on 2 March 1983 and 15 October 1983 are excluded because they do not represent peak observed numbers for those seasons.

2: 164 total equals 15 bulls on April 6 plus 149 cows/calves on April 22.

TABLE 4. DISTRIBUTION OF OBSERVED CARIBOU AND KNOWN MINERAL RESOURCES IN THE RAY MOUNTAINS

LOCATION TWP RNG	CARIBOU			MINERALS			RECOMMEND WITHDRAWAL
	CALVING	E WINTER	L WINTER	COMMODITY CLAIMS	ACTIVITY	RESOURCE I	
06N 17W				Gold	8 Active Exploration	Hypothetical	
20W	X		X				
21W	X			Limestone	0 Occurrence	Submarginal	
23W				Gold/Tin	0 Historic Site	Hypothetical	At Present (PLO 5184)
07N 17W				Gold	20 Active Exploration	Hypothetical	
18W	X			Gold	5 Active Exploration	Submarginal	X
19W	X	X					
20W	X	X	X	Gold	0 Favorable Geology	Speculative	X
08N 18W	X	X	X				X
19W				Coal	Occurrence	Submarginal	
09N 15W			X	Tin	Occurrence	Hypothetical	
10N 16W	X						
18W				Gold	0 Inactive	Hypothetical	
19W			X				
11N 14W				Asbestos	2 Active Exploration	Speculative	
15W				Asbestos	1 Active Exploration	Hypothetical	X
17W	X	X	X				X
18W	X	X	X	Geothermal	Occurrence	Submarginal	X
19W	X	X	X				X
20W				Tungsten	315 Active Exploration	Hypothetical	
21W				Tungsten	365 Active Exploration	Hypothetical	
12N 15W				Asbestos	3 Active Exploration	Speculative	
16W	X						
17W	X		X	Unknown	0 Favorable Geology	Speculative	X
18W		X	X				X
19W	X	X		Gold	1 Active Exploration	Hypothetical	X
20W	X			Unknown	2 Active Exploration	Hypothetical	
13N 16W				Geothermal	Occurrence	Submarginal	
18W	X						
16N 14W				Chromite	5 Active Exploration	Hypothetical	
16W				Chromite	10 Active Exploration	Hypothetical	
17N 16W				Chromite	4 Active Exploration	Hypothetical	

1. Refer to definitions in Table 1.

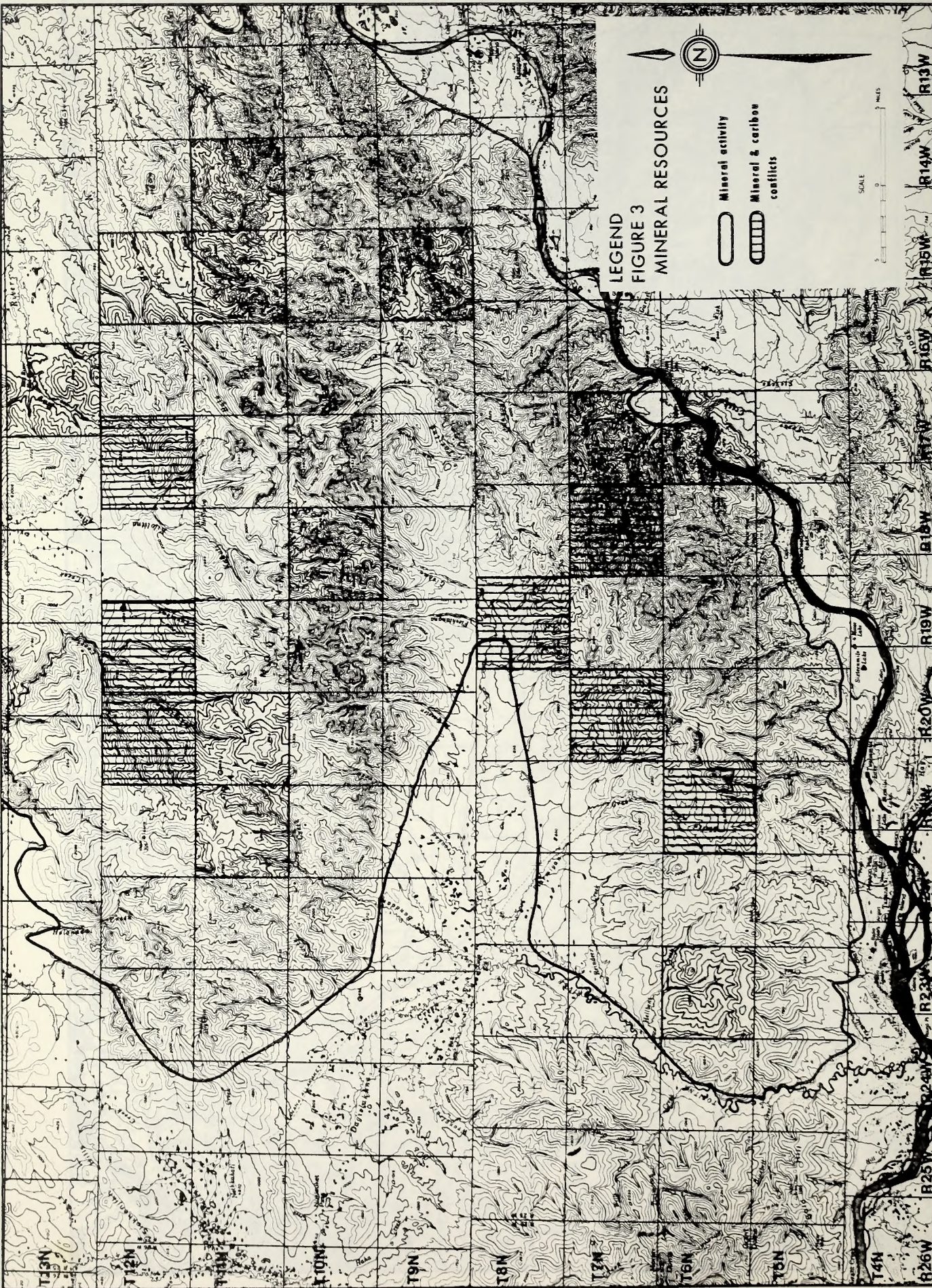


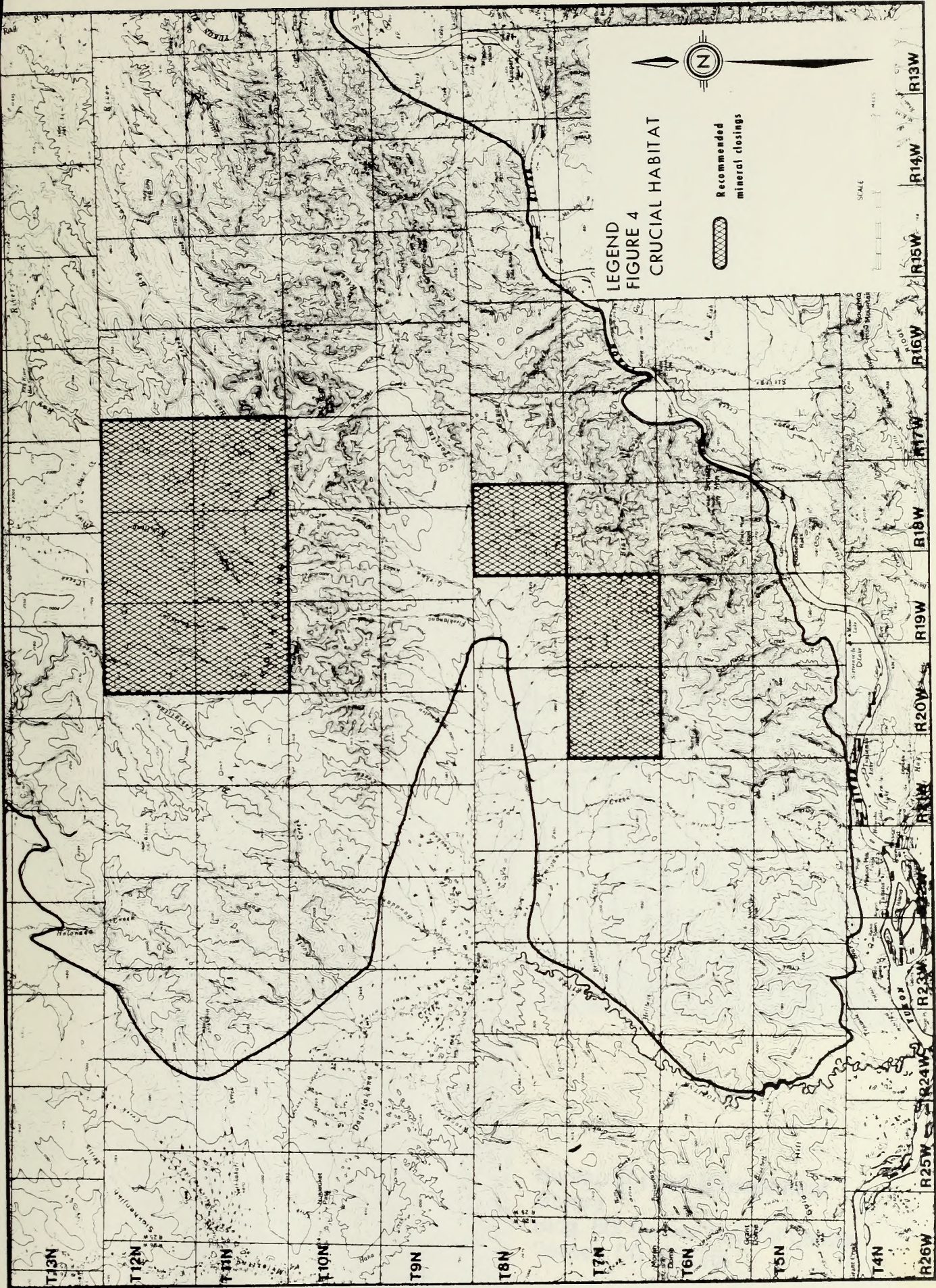
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FIGURE 2  
CARIBOU DISTRIBUTION

- Prime habitat
- Observed caribou
- Caribou trails

SCALE  
0 1 2 3 4 5  
MILES

T4N  
T5N  
T6N  
T7N  
T8N  
T9N  
T10N  
T11N  
T12N  
T13N  
T14N  
T15N  
T16N  
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T18N  
T19N  
T20N  
T21N  
T22N  
T23N  
T24N  
R13W  
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R23W  
R24W  
R25W





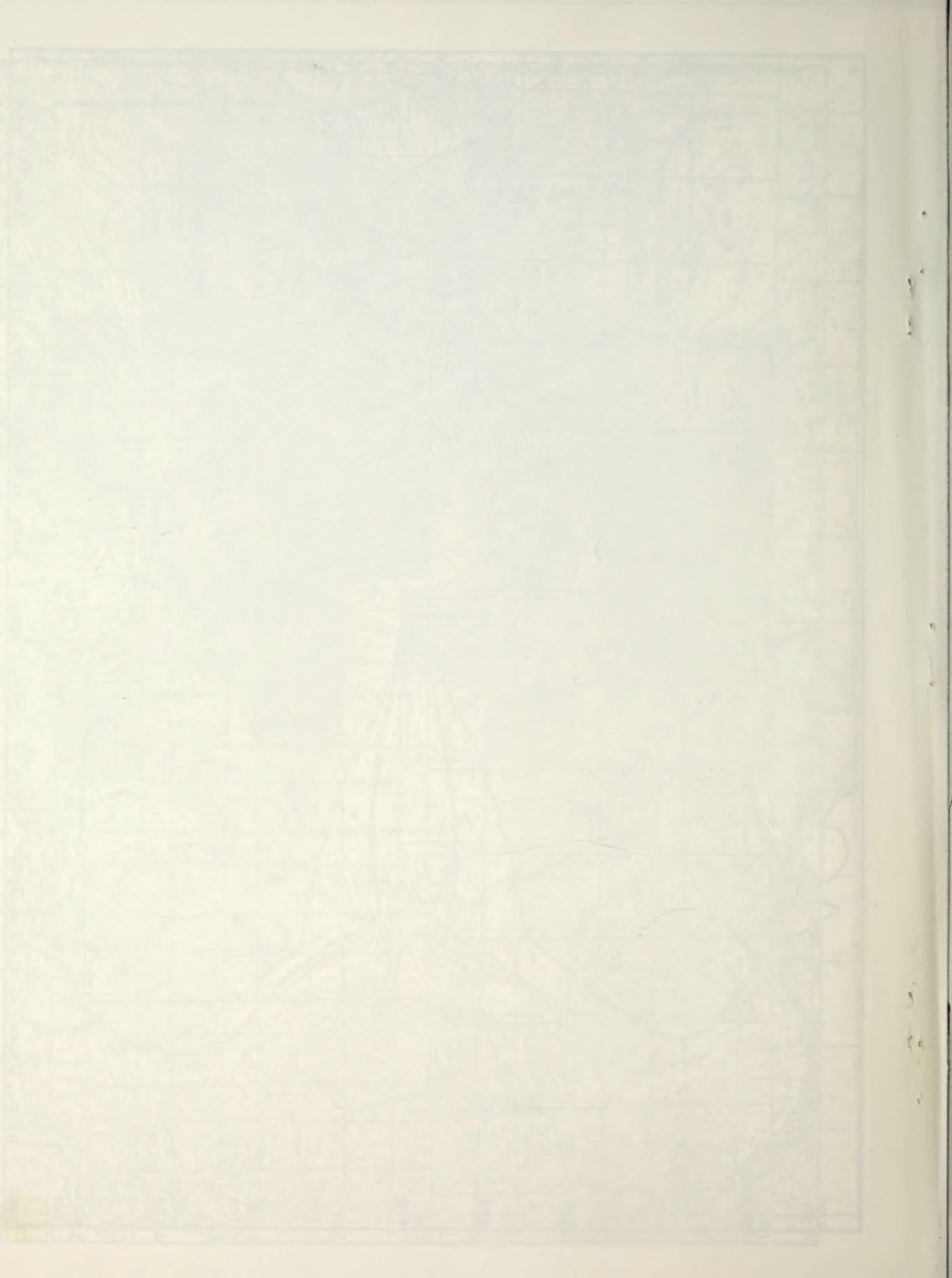
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FIGURE 4  
CRUCIAL HABITAT

Recommended  
mineral closings



SCALE  
1" = 1 MILE

T3N T12N T11N T10N T9N T8N T7N T6N T5N T4N  
R26W R25W R24W R23W R22W R21W R20W R19W R18W R17W R16W R15W R14W R13W





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